SN 09/298,297
Docket No. S-91,723
In Response to Office Action dated November 15, 2005

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently amended) A method for generating materials which exhibit photoinduced charge transfer having a controlled direction, which comprises the steps of:

(a) depositing a donor layer directly onto a substrate, the substrate consisting of non-conductive glass, wherein the donor layer comprises at least one of an electron donor and an energy donor;

(b) depositing a nonlinear optical chromophore material directly onto the donor layer; ~~and~~

(c) depositing an acceptor layer directly onto the nonlinear optical chromophore material, wherein the acceptor layer comprises at least one of an electron acceptor and an energy acceptor; and

(d) self-assembling the donor layer, the nonlinear optical chromophore material layer, and the acceptor layer into a superlattice, whereby photoinduced charge transfer is achieved between the donor layer and the acceptor layer, thereby enhancing the nonlinear optical properties of the nonlinear optical chromophore material.

2. (Currently amended) The method for generating materials which exhibit photoinduced charge transfer having a controlled direction as described in claim 1, wherein the donor layer and acceptor layer~~layers~~ are selected from the group consisting of conjugated polymers, fullerenes, porphyrins, and phthalocyanines.

3. (Original) The method for generating materials which exhibit photoinduced charge transfer having a controlled direction as described in claim 2, wherein the conjugated polymers include conjugated polyelectrolytes.

4. (Original) The method for generating materials which exhibit photoinduced charge transfer having a controlled direction as described in claim 2, wherein the

conjugated polymers include the water-soluble, anionic form of poly(2,5 methyl-propyloxy sulfonate phenylene vinylene).

5. (Original) The method for generating materials which exhibit photoinduced charge transfer having a controlled direction as described in claim 2, wherein the fullerenes include functionalized derivatives of C_{60} having ionic groups such that the fullerenes are rendered water-soluble.

6. (Currently amended) The method for generating materials which exhibit photoinduced charge transfer having a controlled direction as described in claim 1, further including the ~~step~~ steps of ~~inserting~~ depositing at least one transparent spacer layer comprising at least one substantially inert polyelectrolyte ~~between neighboring donor and~~ on the acceptor ~~layers~~layer and depositing a second donor layer on the at least one transparent spacer layer, such that self-quenching is eliminated.

7. (Canceled)

8. (Currently amended) The method for generating materials which exhibit photoinduced charge transfer having a controlled direction as described in claim ~~7~~6, wherein the at least one polyelectrolyte is ~~poly-electrolytes are~~ selected from the group consisting of: poly(ethylene-imine), poly(allyl-amine hydrochloride), poly(di-allyl-amine), poly(styrene sulfonate) and poly(propylene-imine) dendrimers.

9. (Canceled)

10. (Currently amended) The method for generating materials which exhibit photoinduced charge transfer having a controlled direction as described in claim 1, wherein the donor layer, the acceptor layer, and the nonlinear optical chromophore material layer are deposited using ionic self-assembly from aqueous solution.

11. (Original) The method for generating materials which exhibit photoinduced charge transfer having a controlled direction as described in claim 10, wherein the

conformation of the donor layer is controlled by varying the pH of the aqueous deposition solution.

12. (Currently amended) The method for generating materials which exhibit photoinduced charge transfer having a controlled direction as described in claim 1, wherein the nonlinear optical chromophore material includes polymers having nonlinear optical chromophores as side-chain substituents to the polymer backbone.

13. (Currently amended) The method for generating materials which exhibit photoinduced charge transfer having a controlled direction as described in claim 1, wherein the nonlinear optical chromophore material includes PAZO.

14. (Currently amended) A method for generating materials which exhibit energy transfer having a controlled direction, which comprises the steps of:

(a) depositing a donor layer directly onto a substrate, the substrate consisting of non-conductive glass, wherein the donor layer comprises at least one of an electron donor and an energy donor;

(b) depositing a transparent spacer layer comprising at least one substantially inert polyelectrolyte directly onto the donor layer; and

(c) depositing an acceptor layer onto the transparent spacer layer, wherein the acceptor layer comprises at least one of an electron acceptor and an energy acceptor, and wherein the donor layer and acceptor layer are selected from the group consisting of conjugated polymers, fullerenes, porphyrins, and phthalocyanines, wherein the fullerenes include functionalized derivatives of C_{60} having ionic groups such that the fullerenes are rendered water-soluble; and

(d) self-assembling the donor layer, the transparent spacer layer, and the acceptor layer into a superlattice, whereby energy transfer is achieved between the donor layer and the acceptor layer.

15. (Canceled)

16. (Currently amended) The method for generating materials which exhibit energy transfer having a controlled direction as described in claim ~~15~~14, wherein the conjugated polymers include conjugated polyelectrolytes.

17. (Currently amended) The method for generating materials which exhibit energy transfer having a controlled direction as described in claim ~~15~~14, wherein the conjugated polymers include the water-soluble, anionic form of poly(2,5 methyl-propyloxy sulfonate phenylene vinylene).

18. (Canceled)

19. (Currently amended) The method for generating materials which exhibit energy transfer having a controlled direction as described in claim 14, further including the ~~step~~steps of depositing a layer of nonlinear optical chromophore material onto the ~~donor~~ transparent spacer layer and ~~the step of~~ depositing a second transparent spacer layer on the layer of nonlinear optical chromophore material such that the second transparent spacer layer is disposed between the nonlinear optical chromophore material layer and the acceptor material.

20. (Currently amended) The method for generating materials which exhibit energy transfer having a controlled direction as described in claim 19, wherein the nonlinear optical chromophore material includes polymers having nonlinear optical chromophores as side chain substituents to the polymer backbone.

21. (Currently amended) The method for generating materials which exhibit energy transfer having a controlled direction as described in claim 19, wherein the nonlinear optical chromophore material includes PAZO.

22. (Canceled)

23. (Currently amended) The method for generating materials which exhibit energy transfer having a controlled direction as described in claim ~~22~~21, wherein the

poly-electrolytes are selected from the group consisting of: poly(ethylene-imine), poly(allyl-amine hydrochloride), poly(di-allyl-amine), poly(styrene sulfonate) and poly(propylene-imine) dendrimers.

24. (Canceled)

25. (Previously presented) The method for generating materials which exhibit energy transfer having a controlled direction as described in claim 14, wherein the donor layer, the acceptor layer, and the transparent spacer layer are deposited using ionic self-assembly from aqueous solution.

26. (Previously presented) The method for generating materials which exhibit energy transfer having a controlled direction as described in claim 25, wherein the conformation of the donor layer is controlled by varying the pH of the aqueous deposition solution.

27. (Previously presented) The method for generating materials which exhibit photoinduced charge transfer having a controlled direction as described in claim 1, wherein the donor layer comprises poly(2,5 methyl-propyloxy sulfonate phenylene vinylene), the nonlinear optical layer comprises PAZO, and the acceptor layer comprises at least one fullerene.

28. (Previously presented) The method for generating materials which exhibit photoinduced charge transfer having a controlled direction as described in claim 27, further including the step of inserting at least one transparent spacer layer between neighboring donor and acceptor layers, wherein the transparent spacer layer comprises at least one of poly(ethylene-imine), poly(allyl-amine hydrochloride), poly(di-allyl-amine), poly(styrene sulfonate), and a poly(propylene-imine) dendrimer.

29. (Previously presented) The method for generating materials which exhibit energy transfer having a controlled direction as described in claim 14, wherein the donor layer comprises poly(2,5 methyl-propyloxy sulfonate phenylene vinylene), the

transparent spacer layer comprises at least one of poly(ethylene-imine), poly(allyl-amine hydrochloride), poly(di-allyl-amine), poly(styrene sulfonate), and a poly(propylene-imine) dendrimer, and the acceptor layer comprises at least one fullerene.

30. (Currently amended) The method for generating materials which exhibit energy transfer having a controlled direction as described in claim 14, further including the step of depositing a layer of nonlinear optical chromophore material onto the transparent spacer layer and the step of depositing a second transparent spacer layer between the nonlinear optical chromophore material layer and the acceptor material.